

APPARATUS FOR PERFORMING A SERVICE IN COOPERATION
WITH ANOTHER APPARATUS ON A NETWORK

BACKGROUND OF THE INVENTION

5 Field of the Invention

The present invention relates to a communication apparatus, an information processing apparatus, a communication system and a communication method, all of which are applied to a system wherein a plurality of users share various apparatuses connected to a network, and a storage medium on which are stored computer-readable processing steps for implementing the communication method.

Related Background Art

15 Conventionally, apparatuses such as copiers, printers, scanners and facsimile machines, which read and form images, are most often employed independently.

However, as one consequence of the continued development of computers and networks, the use has increased of arrangements, such as the one described above, wherein various types of apparatuses are connected together in a network.

As one example of such formations, a system has become popular with which, by combining a function provided by an apparatus readily available to a user (hereinafter referred to as a logical apparatus) and a function provided by an apparatus connected to a

network (hereinafter referred to as a printer), a series of meaningful processes can be preformed.

5 With this system, the performance of the following example operations is possible. Such as when to copy a document a user employs a local apparatus (a scanner) to scan the document, and to print the document the user transmits the obtained image data across a network to a remote apparatus (a printer). Or when a user employs a local apparatus (a terminal, such as a
10 personal computer) to extract image data from a computer or a database at a distant location on a network, and uses another local apparatus (a printer) to print the thus obtained image data.

When in the above described system a remote
15 apparatus (e.g., a copier) on the network is shared by a plurality of designated users, the unlimited use of the copier by a user other than the designated users must be prevented, and the status of the employment of the copier by each authorized user must be recorded.

20 Therefore, a user who desires to use the copier must first enter a password using the operating section of a terminal (a local apparatus), or must enter his or her user information by employing a management card on which the user information is magnetically recorded.
25 Then, the terminal performs a verification process to authenticate the user. When the user has been authenticated the terminal accepts an entry from the

operating section, requests that the copier (a remote apparatus) on the network perform an operation desired by the user, and at the same time, updates the user's operating record information (information concerning the employment status of the copier, etc.). Therefore, the copier (the remote apparatus) performs an operation in accordance with the request transmitted by the user's terminal (the local apparatus).

However, as is described above, while a local apparatus may perform a verification process to authenticate a user, in response to an operation request received across a network a remote apparatus does not perform a verification process. Instead, it simply accepts the operation request.

Therefore, once the authentication of a user has been performed by a specific local apparatus, the user is permitted to use all the remote apparatuses on the network, i.e., the user may use a remote apparatus the use of which is inhibited. Thus, a problem exists relative to the management and the security of apparatuses.

SUMMARY OF THE INVENTION

To resolve the above problem, it is one objective of the present invention to provide a communication apparatus, an information processing apparatus, a communication system and a communication method whereby

5 It is one more objective of the present invention
to provide a communication apparatus that can
efficiently and accurately manage various apparatuses
connected to a network.

It is an additional objective of the present invention to provide a communication system wherein, when a service is requested for which an immediately available local apparatus and another apparatus that is accessible across a network are used, the performance of a user authentication process can be improved.

It is a further objective of the present invention to provide a communication system wherein, when the scanner function of an immediately available local apparatus and the printer function of another apparatus accessible across a network are employed to perform a copy service, the service is available only to an

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local apparatus and the facsimile function of another apparatus accessible across a network are employed to perform a facsimile transmission service, the service is available only to an authorized user whose right to use the apparatuses has been authenticated.

It is yet a further objective of the presents invention to provide a communication system wherein, when the scanner function of an immediately available local apparatus and the facsimile function of another apparatus accessible across a network are employed to perform a facsimile transmission service, the performance of a user authentication process can be improved.

To achieve the above objectives, according to the present invention, an apparatus, which performs a service in association with a different apparatus accessible across a network, comprises:

registration means for registering in advance predetermined information for a user who is authorized to use the apparatus;

input means for use by the user to enter the user information and a first operating instruction request for the different apparatus;

first authentication means for employing the predetermined information registered by the registration means and the user information entered by the user at the input means to determine whether the

transmission means for, based on the results obtained by the authentication means, transmitting to the different apparatus a second operating instruction and the user information that are entered at the input means;

determination means for employing the results
obtained by the second authentication means to
determine whether the user is to be permitted to use
the service.

20 registration means for registering, in advance,
predetermined information for a user who is permitted
to use the apparatus;

authentication means for employing the information

authentication means for employing the information

determination means for employing the results
5 obtained by the authentication means to determine
whether the operating instruction request received by
the reception means is to be accepted.

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appearance of an operation unit in the image processing
apparatus;

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Fig. 5 is a block diagram illustrating the

arrangement of a printer image processor in the image processing apparatus;

Fig. 6 is a block diagram illustrating the arrangement of an image compression processor in the image processing apparatus;

Fig. 7 is a block diagram illustrating the arrangement of an image rotation processor in the image processing apparatus;

Fig. 8 is a diagram for explaining the transmission of data to the image rotation processor;

Fig. 9 is a diagram for explaining the image rotation process performed by the image rotation processor;

Fig. 10 is a block diagram showing the structure of a device I/F in the image processing apparatus;

Fig. 11 is a diagram for explaining a network system, including the image processing apparatus;

Fig. 12 is a diagram for explaining the function (module) of the image processing apparatus performed by software;

Fig. 13 is a diagram for explaining an application installed in the image processing apparatus;

Fig. 14 is a diagram for explaining an operating screen displayed by the LCD display device of the operation unit;

Fig. 15 is a diagram for explaining an ID input screen displayed by the LCD display device;

Fig. 17 is a diagram for explaining a printer name list sub-screen of the COPY main screen;

Fig. 19 is a diagram for explaining an enlarge/reduce setting sub-screen of the COPY main screen;

Fig. 21 is a diagram for explaining a sorter setting sub-screen of the COPY main screen;

Fig. 23 is a diagram for explaining a SEND main screen displayed by the LCD display device;

20 Fig. 25 is a diagram for explaining a full
 keyboard on each screen displayed by the LCD display
 device;

25 Fig. 27 is a diagram for explaining a detailed
information screen on the address book screen;

Fig. 28 is a diagram for explaining an address

Fig. 29 is a diagram for explaining a search object class list on the address book screen;

Fig. 31 is a diagram for explaining a search object condition list on the address book screen;

10 Fig. 33 is a diagram for explaining search results
displayed on the address search screen;

Fig. 35 is a diagram for explaining a 10-key pad
15 on each screen displayed by the LCD display device;

Fig. 37 is a diagram for explaining a detailed address (Database) on the SEND main screen;

Fig. 39 is a diagram for explaining a hard disk setting screen on the SEND main screen;

Fig. 41 is a diagram for explaining a paper size list on the print setting screen;

Fig. 43 is a diagram for explaining a scan setting screen on the SEND main screen;

Fig. 45 is a diagram for explaining a scan mode list on the scan setting screen;

Fig. 47 is a diagram for explaining a RETRIEVE main screen (WWW sub-screen) displayed by the LCD display device;

Fig. 49 is a diagram for explaining an E-Mail sub-screen on the RETRIEVE main screen;

Fig. 50 is a diagram for explaining a FAX sub-screen on the RETRIEVE main screen;

Fig. 52 is a diagram for explaining a print setting screen on the WWW, E-Mail, FAX and FTP sub-screens;

25 Fig. 53 is a diagram for explaining a TASKS main
screen (WWW sub-screen) displayed by the LCD display
device;

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Fig. 64 is a diagram for explaining the software structure of the scanning operation;

Fig. 66 is a block diagram illustrating the arrangement of the devices employed for the printing operation performed by the image processing apparatus;

Fig. 68 is a diagram for explaining the entries in the DRAM in the engine I/F;

Fig. 70 is a block diagram illustrating the arrangement of the devices employed for the user authentication process performed by the image processing apparatus;

Fig. 72 is a flowchart for explaining the user authentication processing performed in response to a log-on;

Fig. 73 is a flowchart for explaining the processing performed following a log-on, beginning with the scanning operation and ending with the printing operation;

Fig. 74 is a flowchart for explaining the

Fig. 75 is a flowchart for explaining the processing following a log-on, beginning with the scanning operation and ending with the facsimile transmission operation.

10 The preferred embodiment of the present invention
will now be described while referring to the
accompanying drawings.

As is shown in Fig. 1, the image processing apparatus 100 comprises a control unit 110, for the input and the output of image information and device information, an operation unit 132, a scanner 133, which is an image input device, and a printer 135, which is an image output device, all of which are connected to the control unit 110. The control unit 110 is connected both to a LAN (Local Area Network) 128 and to a WAN (Wide Area Network) by a public telephone line.

The control unit 110 comprises: a CPU 111, for providing overall control for the image processing

With this arrangement, the operation unit I/F 116
15 outputs image data to the operation unit 132 for the
display on the display section of the operation unit
132, which will be described later, or transmits to the
CPU 111 information entered at the operation unit 132
by a user.

20 In addition to the above described arrangement,
the control unit 110 further comprises: a raster image
processor (RIP) 121, for developing a PDL record to
provide a bit map image; a device I/F 122, which
functions as an interface for the scanner 133 and the
25 printer 134; a scanner image processor 123, for
correcting, processing or editing image data entered by
the scanner 133; an image rotation processor 125, for

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[Image input/output section:  scanner 133 and printer
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When using the scanner 133, which is an image input device, first, a user places a document on a tray

152 of a document feeder 151. Then, to start the reading of the document, the user enters an instruction at the operation unit 132. This instruction is transmitted by the CPU 111 to the scanner 133 (see
5 arrows 130 in Fig. 1). Subsequently, the feeder 151 feeds individual sheets of the document into the scanner 133.

In the scanner 133, an image on the document sheet is irradiated (not shown) and scanned by a CCD line
10 sensor (not shown), and the scanned data are converted into electric signals representing raster image data. The raster image data for the document sheet, which are obtained by the scanner 133, are transmitted to the device I/F 122 (see the arrows 130 in Fig. 1).

15 The arrows 130 in Fig. 1 represent the flow of the transmission of data or instructions between the device I/F 122 and the scanner 133.

For the printer 134, which is an image output device, a plurality of paper supply levels are provided
20 to enable the selection of different paper sizes, or a different paper direction, and corresponding paper cassettes 162, 163, 164 and 165 are provided. A paper discharge tray 161 is used to hold printed sheets.

The thus structured printer 134 is activated when
25 an instruction is received from the CPU 111 (see arrows 131 in Fig. 1). The printer 134 receives the raster image data from the CPU 111, and employs (converts) the

data to form an image on a supplied sheet. For this process, electrophotography, using a photosensitive drum or a photosensitive belt, or the ink-jet printing method, for the direct printing of an image by the ejection of ink from arrays of tiny nozzles, is employed

The arrows 131 in Fig. 1 represent the flow of the transmission of data or instructions between the device I/F 122 and the printer 134.

10 [Operation unit 132]

As is shown in Fig. 3, an LCD display device 171, a start key 172, a stop key 173, an ID key 174, a reset key 175 and an LED 176 are provided for the operation unit 132.

15 For the LCD display device 171, a touch panel sheet is attached to an LCD. A screen for the performance of various operations by the apparatus 100 is displayed on the LCD, and when a key on the display is depressed, that positional information is transmitted to the CPU 111.

20 The start key 172 is used to initiate the scanning of a document image. An LED 176, which consists of green and red LEDs, is located in the center of the start key 172, and the color of the LED that is turned on is used to notify a user that use of the start key 172 is enabled or disabled.

The stop key 173 is used to halt a currently

The ID key 174 is used by a user to enter his or her ID (user ID).

[Scanner image processor 123]

The image bus I/F 181 is connected to the image bus 120, and has as one function the control of the bus access sequence, and has as another function the control of the individual devices of the scanner image processor 123 and the generation of an operating timing.

20 The editing unit 183 employs the image data read
by the scanner 133 to identify a closed area defined by
a marker pen, and performs image processing, such as
shading, dotting or negative/positive inversion, for
image data in the closed area.

25 The variable scale unit 184 performs interpolation
for the primary scanning direction of the raster image
and enlarges or reduces an image in order to change the

them to provide a resolution that can be used by the printer 134.

The smoothing unit 193 removes jaggies (stairstepped or saw-toothed effects that appear at a monotone border in an image) for the image data that have been processed by the resolution converter 192, and provides an image with smooth edges.

[Image compression processor 126]

As is shown in Fig. 6, the image compression processor 126 comprises: an input buffer 202; an image compression unit 203, for receiving the output of the input buffer 202; a RAM 204, which is connected to the image compression unit 203; and an output buffer 205, for receiving the output of the image compression unit 203. The input buffer 202 and the output buffer 205 are connected to an image bus I/F controller 201.

The image bus I/F controller 201, which is connected to the image bus 120, has as one function the control of the bus access sequence, and has as another function the control of the timing for the exchange of data with the input buffer 202 and the output buffer 205 and the setting of a mode for the image compression processor 126.

In the following manner, the image compression unit 203 compresses image data received from the input buffer 202.

First, the CPU 111 sets up, via the image bus 120,

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The image data are temporarily stored in the RAM 204 because data for several lines are required, depending on the type of image compression process, and because data for the first line can not be compressed until data for several lines have been prepared.

10 The image data compressed by the image compression
unit 203 are immediately transmitted to the output
buffer 205.

15 image data from the image compression unit 203 to the
image bus I/F controller 201.

The image bus I/F controller 201 transmits the received image data to the RAM 112 or to the individual devices via the image bus 120.

20 The series of processes described above is
repeated so long as the CPU 111 permits the image bus
I/F controller 201 to transmit image data (until the
processing of image data for necessary pages is
completed), or until the image compression unit 203
25 issues a stop request because an error occurred during
the compression.

In the above explanation, the image compression

[Image rotation processor 125]

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Following the completion of these designations, the CPU 111 permits the image bus I/F controller 211 to

transmit image data. In accordance with this permission, the image bus I/F controller 211 receives image data from the RAM 204 and the individual devices via the image bus 120.

5 Assume that the image data to be transmitted are 32-bit data for a binary image, that the image rotation unit 212 performs the image rotation process for each block of 32×32 bits, and that image data for each 32 bits are transmitted to the image bus 120.

10 In this case, as is shown in Fig. 8, the transmission of 32 bits of data from the image bus I/F controller 211 to the image rotation unit 212 is performed 32 times and at discontinuous addresses (discontinuous addressing), so that the image rotation
15 unit 212 obtains data B_x for one block for image rotation.

 The image rotation unit 212 writes the received image data in the RAM 213, so that when read the image data are rotated at a desired angle, as is shown in
20 Fig. 9. Specifically, for the counterclockwise rotation direction of 90 degrees, for example, the first received 32-bit data are written in the Y direction. Therefore, to read the 32-bit data from the RAM 213, the data are read in the X direction, so that
25 an image is rotated.

 When 32×32 bits of image data have been written in the RAM 213 (image rotation has been completed), the

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image rotation unit 212 reads the image data from the RAM 213 in the above described manner, and transmits them to the image bus I/F controller 211.

5 Through continuous addressing, the image bus I/F controller 211 transmits the received image data to the RAM 112 or to individual devices via the image bus 120.

The series of processes described above is repeated so long as the CPU 111 permits the image bus I/F controller 211 to transmit image data (until the processing of image data for necessary pages has been completed).

[Device I/F 122]

As is shown in Fig. 10, the device I/F 122 comprises: a serial to parallel/parallel to serial converter (hereinafter referred to simply as a converter) 223 and a scan buffer 222, both of which receive the output of the scanner 133, and a parallel to serial/serial to parallel converter (hereinafter referred to simply as a converter) 224 and a print buffer 225, both of which receive the output of the printer 134. The converters 223 and 224 are connected to an image bus I/F controller 221.

The image bus I/F controller 221, which is connected to the image bus 120, has a function for the control of the bus access sequence, a function for the control of the individual devices in the device I/F 122 and the generation of an operating timing, and a

function for the generation of a control signal for the scanner 133 and the printer 134.

The scan buffer 222 is used to temporarily hold image data received from the scanner 133, and to output
5 the image data in synchronization with the operating timing for the image bus 120.

The converter 223 arranges image data received from the scan buffer 222 in a predetermined order, or separates the image data and rearranges them so that
10 they have a width that is suitable for transmission to the image bus 120.

The converter 224 separates the image data received from the image bus 120, or rearranges them, so that they have a width that can be stored in the print
15 buffer 225.

In the print buffer 225, the image data obtained by the converter 224 are stored temporarily, and are synchronously output to the printer 134.

While an image is being scanned by the scanner
20 133, the following processing is performed by the device I/F 122.

First, in synchronization with a timing signal output by the scanner 133, the image data transmitted by the scanner 133 are temporarily stored in the scan
25 buffer 222.

At this time, if a PCI bus, for example, is employed as the image bus 120, and 32 bits or more of

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image data are stored in the scan buffer 222, 32 bits of image data are transmitted to the converter 223 in a first-in and first-out manner. The converter 223 performs the above described conversion for the
5 received 32 bits of image data, and transmits the resultant image data via the image bus I/F controller 221 to the image bus 120.

If an IEEE1394 bus is employed as the image bus 120, image data stored in the scan buffer 222 are
10 transmitted to the converter 223 in a first-in and first-out manner. The converter 223 converts the received image data into serial data as is described above, and transmits the serial data via the image bus I/F controller 221 to the image bus 120.

15 While an image is being printed by the printer 134, the following processing is performed by the device I/F 122.

When, for example, a PCI bus is employed as the image bus 1120, 32 bits of image data are transmitted
20 from the image bus 120 to the image bus I/F controller 221. The image bus I/F controller 221 then transmits the received image data to the converter 224.

The converter 224 converts the received image data into image data that correspond to the number of data
25 bits input for the printer 134, and temporarily stores them in the print buffer 225.

If an IEEE1394 bus is employed as the image bus

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5 The converter 224 converts the received image data
into image data that correspond to the number of data
bits input for the printer 134, and temporarily stores
them in the print buffer 225.

The hardware arrangement of the essential portion
of the image processing apparatus 100 has been
15 explained.

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[Overall system configuration]
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As is described above, the image processing apparatus 100 comprises the scanner 133 and the printer 134, and can read image data from the scanner 133 and transmit them to the LAN 128, or can receive image data via the LAN 128 and print them using the printer 134.

Furthermore, the image processing apparatus 100 can employ facsimile (FAX) transmission means (not

5 In addition to the image processing apparatus, a
database server 232, a database client 233, an E-mail
client 234, an E-mail server, a WWW (World Wide Web)
server 236, a DNS (Domain Name System) server 237, a
printer 238 and a router 245 are connected to the LAN
10 128.

15 The database server 232 manages, as a database,
image data (data for a binary image or a multi-valued
image) that are read by the image processing apparatus
100 (specifically, by the scanner 133).

The E-mail server 235 can receive, as information attached to an E-mail, image data read by the image processing apparatus 100 (specifically, by the scanner 133).

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transmitted to the E-mail server 235, or can transmit E-mail.

The WWW server 236 provides an HTML (Hyper Text Markup Language) document for the LAN 128. The HTML document provided by the WWW server 236 can be printed by the image processing apparatus 100 (specifically, by the printer 134).

The router 245 is used to link the LAN 128 with the Internet/Intranet 243.

The image processing apparatus 100', the database server 240, the WWW server 241 and the E-mail server 242, all of which are connected via the Internet/Intranet 243 to the router 245, have the same respective functions as have the image processing apparatus 100, the database server 232, the WWW server 236 and the E-mail server 235.

The image processing apparatus 100 can exchange data with the facsimile machine 231, and also with the printer 238 via the LAN 128. Therefore, the image processing apparatus 100 can also employ the printer 238 to print image data that it has read.

[Overall software configuration]

Fig. 12 is a block diagram illustrating the functions (modules) of the image processing apparatus 100 which are implemented by software.

A user interface (UI) module 251 manages a user interface, and intercedes with the apparatus 100 when

which controls the distribution of data, in accordance with an instruction entered by an operator, distributes (transmits) data to a communication (output) destination specified in the instruction. When an operator employs the scanner 133 (the scanner function) of the apparatus 100 to instruct the generation of distributed data, the universal send module 254 permits the control API module 268 to activate the apparatus 100 for the generation of distributed data.

10 A printer (P550) module 255 is executed when a
printer (e.g., the printer 238) is designated an output
destination by the universal send module 254.

An E-mail module 256 is executed when an E-mail address is designated a communication destination by the universal send module 254.

A database (DB) module 257 is executed when a database (the database server 232) is designated an output destination by the universal send module 254.

A DP module 258 is executed when an apparatus (the image processing apparatus 100') that corresponds to the apparatus 100 is designated an output destination by the universal send module 254.

A remote copy scan module 259 employs the scanner 133 (scanner function) of the apparatus 100 to perform the copy function, as is performed independently by the apparatus 100, while designating, as an output destination, another apparatus (e.g., the image

processing apparatus 100') connected to the network.

A remote copy print module 260 employs the printer 134 (printer function) of the apparatus 100 to perform the printing function, as is performed independently by the apparatus 100, while designating, as an input destination, another apparatus (e.g., the image processing apparatus 100') connected to the network.

A Web print module 261 reads and prints
information found on various home pages on the Internet
10 or the Intranet.

An HTTP communication module 262 is used when the apparatus 100 performs communication using HTTP, and provides communication for the Web server module 253 and the Web print module 261 using a TCP/IP communication module 266 that will be described later.

An LPR (Line Printer Daemon) module 263 provides communication for the printer module 255 in the universal send module 254 using the TCP/IP communication module 266 that will be described later.

20 An SMTP (Simple Mail Transfer Protocol) module 264
provides communication for the E-Mail module 256 in the
universal send module 254 using the TCP/IP
communication module 266.

An SLM (Salutation-Manager or Smart Link Manager) module 265 employs the TCP/IP communication module 266 to provide communication for the DB module 257 and the DP module 258 in the universal send module 254, the

The TCP/IP communication module 266 employs a network driver 267, which will be described later, to provide network communication for the various modules described above.

The control API module 268 provides, for an upstream module, such as the universal send module 254, an interface with a downstream module, such as a job manager module 269 that will be described later. Therefore, the dependency between the upstream and the downstream modules is reduced and the diversity of each module is enhanced.

A codec manager module 270 controls various data compression and decompression processes as instructed by the job manager module 269.

An FBE encoder 271 compresses, in accordance with an FBE format, data that are read during the scanning

process by the job manager module 269 and a scanner manager module 274.

5 A JPEG compression/decompression unit (codec manager) 272 employs the JPEG method to compress the data read during the scanning process performed by the job manager module 269 and the scanner manager module 274, and to develop (decompress) print data during the printing process performed by the printer manager module 276. An MMR compression/decompression unit (MMR
10 codec) 273 employs the MMR method to compress data read during the scanning process performed by the job manager module 269 and the scanner manager module 274, and to develop (decompress) print data during the printing process performed by the printer manager
15 module 276.

The scanner manger module 274 controls the scanning process instructed by the job manager module 269.

20 A SCSI driver 275 communicates with the scanner manager module 274 and with the scanner 133 that is internally connected to the apparatus 100.

The printer manager module 276 controls a printing process instructed by the job manager module 269.

25 An I/F (engine I/F) driver 277 serves as an I/F between the printer manager module 276 and the printer 134 (printing unit).

A parallel port driver 278 provides an I/F when

[Application]

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operation unit 132 explained while referring to Fig. 3.

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universal send module 254 in Fig. 12).

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for the Web server module 253 in Fig. 12.

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application for a remote print reception side (the

An application 289 (Notes Server) is an application that controls the Notes Server which stores, in a database, image data that are simultaneously distributed by the application 289.

An application 291 (Mail Server) is an application that controls the Mail Server which stores, in a file, image data that are simultaneously distributed by the application 283.

An application 293 (Web Server) is an application for the Web Server that includes information contents.

A detailed explanation will now be given for the main applications among the above applications 281 to 293.

The UI (user interface) and the address book 252

have been described above, but a more specific explanation will be given for the address book 252 for which the UI module 251 (see Fig. 12) performs the addition, the deletion and the extraction of data.

5 The address book 252 is stored in a nonvolatile memory (e.g., on a hard disk) provided for the image processing apparatus 100, and the contents of the address book 252 are data for the features of various devices connected to the network.

10 For example, the following data are described in the address book 252.

- * the official name of a device and its alias
- * the network address of a device
- * a network protocol available for a device
- 15 * a document format available for a device
- * a compression method (type) available for a device
- * an image resolution available for a device
- * an available paper size and paper cassette level
- 20 information if an object device is a printer
- * the name of a folder for the storage of a document if an object device is a server (computer)

 The following applications can identify the feature of a distribution destination by examining the
25 various data items stored in the address book 252.

- * application 282 (Remote Copy)
- * application 283 (Universal Send)


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* application 285 (Web Server)
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<Application 282 (Remote Copy)>

It should be noted that "SLM" is one type of network protocol that includes device control information called "Salutation Manager" or "Smart Link Manager".

<Application 283 (Universal Send)>

25 The application 283, unlike the application 282
 (Remote Copy), can simultaneously transmit, to a
 plurality of distribution destinations, image data that
 are obtained through the scanning of one image by the

scanner 133. Further, the image data can be transmitted not only to the printer but also directly to a so-called server computer.

An example distribution process in accordance with
5 the type of distribution destination device will be
explained.

Assume that it is determined from data in the address book 252 that a distribution destination device can process the LPD (Line Printer Daemon), which is a network printer protocol, and an LIPS, which is a printer control command. First, the resolution available for the device that is designated a distribution destination is obtained from the address book 252. In accordance with the results obtained, the image data read by the scanner 133 are compressed using the FBE (First Binary Encoding) method. The compressed image data are then LIPS coded, and the resultant image data are transmitted to the destination by the LPR module 263 (in accordance with the LPR that is a network printer protocol).

If it is determined from data in the address book 252 that the destination device is a server device for which the SLM can be used for communication, the server address and the designated folder in the server are identified. Then, as does the application 282, the application 283 employs the MMR method to compress image data (binary image data) obtained by the scanner

133. The compressed image data are formatted in accordance with the TIFF (Tagged Image File Format), and the resultant data are stored by the SLM module 265 in a specific folder in the server device on the
5 network.

If it is determined from data in the address book 252 that the destination device is a server device that can process image data compressed using the JPEG method (multi-valued image data), the server address and the
10 designated folder in the server are identified by referring to the address book 252. Then, in the same manner as that used for the binary image data, the multi-valued image data read by the scanner 133 are compressed using the JPEG method. The compressed image
15 data are then formatted in accordance with the TIFF, and the resultant data are stored by the SLM module 265 in a specific folder in the server device on the network.

If it is determined from data in the address book
20 252 that the destination device is a device on the E-mail server side, a mail address is obtained from the address book 252. Then, binary image data read by the scanner 133 are compressed using the MMR method. Thereafter, the compressed image data are formatted in
25 accordance with the TIFF, and the resultant image data are transmitted to the E-mail server by the SMTP module 264. The application 291 (Mail Server) is employed for

This completes the explanation of the software arrangement for the image processing apparatus 100.

10 [Operation screen]

Therefore, when a user selects one of the main tabs 302 to 307 that corresponds to a desired function, the operation screen 301 is changed to a screen for a corresponding category. If the switching to a screen for another category is not permitted, i.e., if the execution of another function is not permitted, the display colors of the main tabs 302 to 307 are changed

and there is no further reaction to the depression of any of the main tabs.

5 The copy function "COPY" includes a function for employing the scanner 133 of the apparatus 100 and the printer 134 to copy data contained in a document (hereinafter referred to as document data), and a function (hereinafter also referred to as a remote copy function) for employing the scanner 133 and the printer 238 (remote printer) on the network to copy document data.

10 The transmission function "SEND" transmits document data read by the scanner 133 to the E-mail server 235, the printer 238, the facsimile machine 231, the file transmitter (FTP) and the database server 232. At this time, a plurality of addresses can be designated.

15 The printing function "RETRIEVE" externally obtains document data, and prints them using the printer 134 of the apparatus 100. The WWW, E-mail, file transmission, and the facsimile machine 231 can be employed as means for obtaining the document data.

20 The task function "TASKS" generates and manages a task for the automatic processing of document data externally received via the facsimile machine 231 or the Internet, and for periodically executing the above printing function.

The information management function "MGMT" manages

a job address book, a book mark, and document account information.

The setup function "CONFIG" sets the configuration of the apparatus 100 (the network or the timer).

5 [ID input screen]

Immediately after the image processing apparatus 100 is powered on, or when an ID key is depressed, the ID input screen 311 shown in Fig. 15 is displayed.

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10 The ID input screen 311 includes an ID input box 312, a password input box 313, a number key box 314 and an OK button 315.

First, a user employs the number keys 314 to enter a correct user ID and a password in the ID input box 312 and the password input box 313, and depresses the
15 OK button 315. Then, the operation screen 301 in Fig. 14 is displayed to enable the manipulation of devices on that screen.

The ID input box 312 and the password input box 313 can be switched by directly designating a desired
20 area to input.

[COPY screen]

Fig. 16 is a diagram showing the COPY main screen 321 that is displayed upon the depression of the main tab "COPY" 302.

25 The COPY main screen 321 includes a printer select button 324, a printer display box 323, an image quality select button 326, an image quality display box 325, a

copy parameter display box 322, scale setting buttons
327 and 328, a paper select button 329, a sorter
setting button 331, a double-sided copy setting button
333, a density indicator and a density setting button
5 330, and a number key box 335.

When, for example, the printer select button 324
is selected, as is shown in Fig. 17, a list 341 of
available printers (the printer 134 of the apparatus
100 and the printer 238 on the network) is displayed as
10 a pull-down menu. When a desired printer is selected
from the printer list 341, the printer list 341
disappears, and as is shown in Fig. 16, the selected
printer name is displayed in the printer display box
323.

15 If the image quality setup button 326 is selected,
as is shown in Fig. 18 an image quality list 342 is
displayed as a pull-down menu. When a desired image
quality is selected from the image quality list 342,
the image quality list 342 disappears, and as is shown
20 in Fig. 16, the selected image quality is displayed in
the image quality display box 325.

If the scale setting button 327 or 328, the paper
select button 329, the sorter setting button 331 and
the double-sided copy setting button 333 are depressed
25 as needed, corresponding sub-screens are displayed.
That is, upon the depression of the scale setting
button 327 or 328, the enlarge/reduce setting

sub-screen 343 in Fig. 19 is displayed; upon the depression of the paper select button 329, the paper select sub-screen 344 in Fig. 20 is displayed; upon the depression of the sorter setting button 331, the sorter setting sub-screen 345 in Fig. 21 is displayed; and upon the depression of the double-sided copy setting button 333, the double-sided copy setting sub-screen 346 in Fig. 22 is displayed. The individual parameters for the corresponding sub-screens can thereafter be set. Furthermore, upon the depression of the density indictor and density setting button 330, the density can be designated.

As is described above, the user sets the various parameters, returns the screen to the COPY main screen 321 in Fig. 16, and depresses a start button 339. Thus, the scanner 133 is activated to read document data, and the document data are transmitted to a selected printer, which prints a copy in accordance with the various designated parameters that are displayed on the COPY main screen 321 in Fig. 16.

[SEND screen]

Fig. 23 is a diagram showing the SEND main screen 351 that is displayed upon the depression of the main tab "SEND" 303.

The SEND main screen 351 includes an address display box 352, a detailed address count display box 353, an address scroll button 354, an address book

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For the subject input box 355, the message input box 356 and the file name input box 357, the full keyboard 381 shown in Fig. 25 is displayed upon the selection of one of these boxes to enable the input of a corresponding entry.

When the address book button 358 is depressed on the SEND main screen 351 in Fig. 23, the address book sub-screen 391 in Fig. 26 is displayed.

Upon the depression of one of the sorting set
25 buttons 395 to 397, the addresses (items) in the
address book display box 392 are sorted by class,
alphabetically by name in the ascending order, or

alphabetically by name in the descending order.

If a detailed information button (Detail) 396 is depressed while one of the items in the address book display box 392 is selected, the detailed information screen 401 in Fig. 27 is displayed.

On the detailed information screen 401, all the information obtained from the address book 252 is displayed for the selected item.

To close the address book sub-screen 391, the OK button 399 or a cancel button 398 must be depressed. Thereafter, the address book sub-screen 391 will be closed and the SEND main screen 351 displayed.

[Search sub-screen]

When a search button (Search) 395 is depressed on the address book sub-screen 391 in Fig. 26, the search sub-screen (address search screen) 411 in Fig. 28 is displayed.

The search sub-screen 411 is used to perform a search of the address book 252 (a local address book) and an external address server to obtain an address. The upper portion on the screen is a search condition setting portion.

When a search object class set button 417 is depressed, the search object class list 431 in Fig. 29 is displayed. After a desired search object class has been selected from the list 431, it is displayed in a search object class display box 416.

Upon the depression of a search object attribute setting button 419, the search object class attribute list 441 in Fig. 30 is displayed. The attributes included in the list 441 are changed as follows in accordance with the search object class displayed in the search object class display box 416.

Common Name·Address·Country (Class: Person)
Common Name·Owner·Location·Model·Type·Resolution
·Color·Finisher (Class: Printer)
Common Name·Member (Class: Group)
All the attributes (Class: Everything)

When a search object condition set button 421 is depressed, the search object condition list 451 in Fig. 31 is displayed. After a desired condition has been selected from the list 451, it is displayed in the search object condition display box 420.

Upon the depression of a search object address book set button 424, the search object address book list 461 in Fig. 32 is displayed. After a desired address book has been selected from the list 461, it is displayed in the search object address book display box 423.

Therefore, the currently selected search conditions are displayed in the search object class display box 416, the search object attribute display box 418, the search object condition display box 420, and the search object address book display box 423.

When a search object attribute value input box 422 is selected, the full keyboard 381 in Fig. 25 is displayed for the entry of a value.

5 Upon the depression of a search execution button (Do Search) 425, a search is initiated in accordance with the various search conditions that have been selected. The search results are displayed in a search result display box 412 on the screen 471 in Fig. 33, and the number of search result entries is displayed in
10 a search result count display box 415.

When one of search result items in the search result display box 412 is selected and the detailed information button (Detail) 426 is depressed, the
15 detailed information sub-screen 401 in Fig. 27 is displayed for the selected item. If a specific search result item that is displayed is to be added as an address, as is shown in Fig. 33, a select check mark is added to the desired item and an OK button 428 is depressed. Then, the search sub-screen 471 (411) is
20 closed, the SEND main screen 351 in Fig. 23 again appears, and the item with the select check mark is added as an address. However, if a cancel button 327 is depressed, the search sub-screen 471 (411) is closed and the SEND main screen 351 in Fig. 23 again appears,
25 but the address list is not changed.

[Detailed address sub-screen]

When the New button 359 is depressed on the SEND

The details of the selected address are displayed in one of display boxes 512 to 515 that corresponds to the detailed address input box 486 to 489 (see Fig. 34) on the detailed address (Person) class screen 511. The address can be edited using the number-key pad 501 in Fig. 35, or the full keyboard 381 in Fig. 25 in the same manner as it was used to make the entries in the detailed address input boxes 486 to 489.

When the "DataBase" address class is selected on the SEND main screen 351 in Fig. 23, and the edit button 360 is depressed, the detailed address (DataBase) class screen 521 in Fig. 37 is displayed.

On the detailed address (DataBase) class screen 521, the database name is displayed in a box 522, and a folder list 3312 is displayed in a box 523.

When the "Group" class address is selected on the SEND main screen 351 in Fig. 23 and the edit button 360 is depressed, the detailed address (Group) class screen 531 in Fig. 38 is displayed.

On the detailed address (Group) class screen 531, group members are displayed in a box 532.

[HD Setting sub-screen]

Upon the depression of the HD check button 363 on the SEND main screen 351 in Fig. 23, the hard disk setting screen 541 in Fig. 39 is displayed.

This hard disk setting screen 541 can be used to designate the setup to be used for transmitting data to

the hard disk.

[Print Out sub-screen]

When the print out check button 364 is depressed on the SEND main screen 351 in Fig. 23, the print set
5 screen 551 in Fig. 40 is displayed.

The number of copies, the paper size, the scale ratio, double-sided printing, the sorting and the resolution can be designated using the print setting screen 551.

10 When, for example, a paper size select button 556 is depressed, as is shown in Fig. 41 a paper size list 571 is displayed. A desired paper size is selected from the list 571 and is displayed in a paper size display box 555, as is shown in Fig. 40. When a sorter
15 select button 561 is depressed, the sorter list 581 in Fig. 42 is displayed. A desired sorter is selected from the list 581 and is displayed in a sorter display box 560, as is shown in Fig. 40.

[Scan Setting sub-screen]

20 When the scanner check button 365 is depressed on the SEND main screen 351 in Fig. 23, the scan setting screen in Fig. 43 is displayed.

On the scan setting screen 591, a desired mode is selected from those displayed in a preset mode select
25 box (Preset Mode) 592 ("Photo" mode in Fig. 43), and the resolution, the scan mode and the density that are set in advance and that correspond to the selected mode

are respectively displayed in display boxes 598, 600 and 602. These values that are set in advance can be changed manually.

5 Upon the depression, for example, of a resolution select button 599, the resolution list 611 in Fig. 44 is displayed. When a desired resolution has been selected from the list 611, the resolution is set and is displayed in the resolution display box 598, as is shown in Fig. 43.

10 Similarly, upon the depression of the mode select button 601, the scan mode list 621 in Fig. 45 is displayed. When a desired scan mode has been selected from the list 521, that scan mode is set and is displayed in the scan mode display box 600.

15 Upon the depression of a paper size button 597, the paper size list 611 in Fig. 46 is displayed as a pull-down menu. A paper size and a paper direction are selected from the list 631, and are displayed in the paper size display box 596, as is shown in Fig. 43.

20 [RETRIEVE screen]

Fig. 47 is a diagram showing the RETRIEVE main screen 641 that is displayed upon the depression of the main tab "RETRIEVE" 304.

25 The RETRIEVE main screen 641 includes WWW, E-Mail, FAX and ETP sub-tab buttons 642 to 645, and an HD check button 646 and a print out check button 647, which are used in common for each sub-category.

When one of the sub-buttons 642 to 645 is depressed, the WWW, E-Mail, FAX or ETP sub-screen is displayed, which will be described later.

At the time of initialization, including
5 resetting, the WWW sub-screen is displayed.

[WWW sub-screen]

When the WWW sub-tab 642 is depressed on the RETRIEVE main screen 641 in Fig. 47, a WWW sub-screen 661 in Fig. 47 is displayed.

10 Upon the selection of a URL input box 648 on the WWW sub-screen 661, the full keyboard 381 in Fig. 25 is displayed, and can be used to enter a URL. When "Link Depth" and "Max Pages" input boxes 649 and 651 are
15 selected, the number-key pad 501 in Fig. 35 is displayed for the entry of individual values.

When the URL and the values have been entered in the URL input box 648 and the "Link Depth" and "Max Pages" input boxes 649 and 651, and a start button 662 is depressed, in accordance with the setup a home page
20 is printed.

It should be noted that when nothing is displayed in the URL input box 648 and the "Link Depth" and "Max Pages" input boxes 649 and 651, i.e., when nothing has been designated, no function is initiated upon the
25 depression of the start button 662.

[Bookmark sub-screen]

When a bookmark button (Bookmark) 656 is depressed

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on the WWW sub-screen 661 in Fig. 47, the bookmark sub-screen 671 in Fig. 48 is displayed.

5 A book mark list is displayed in a bookmark display box 672 on the bookmark sub-screen 671. When the row occupied by a desired bookmark in the list is depressed, the bookmark is selected. Upon the depression of an OK button 677, the bookmark sub-screen 671 is closed, and the selected bookmark is displayed in the URL input box 648 on the WWW sub-screen 661 in Fig. 47.

[E-Mail sub-screen]

When the E-Mail sub-tab 643 is depressed on the RETRIEVE main screen 641 in Fig. 47, the E-Mail sub-screen 681 in Fig. 49 is displayed.

15 When a server input box (Server) 682, a login name input box (Login Name) 683 and a password input box (Password) 684 are selected, the full keyboard 381 in Fig. 25 is displayed for the entry of a server, a login name and a password so that E-mail can be received from the server.

[FAX sub-screen]

When the FAX sub-tab 644 is depressed on the RETRIEVE main screen 641 in Fig. 47, the FAX sub-screen 691 in Fig. 50 is displayed.

25 Upon the selection of a facsimile number input box 692 on the FAX sub-screen 691, the number-key pad 501 in Fig. 35 is displayed for the entry of the facsimile

number.

[FTP sub-screen]

Upon depression of the FTP sub-tab 6456 on the
RETRIEVE main screen 641 in Fig. 47, the FTP sub-screen
5 701 in Fig. 51 is displayed.

When a server input box (Server) 702, a login name
input box (Login Name) 703 and a password input box
(Password) 704 are selected on the FTP sub-screen 701,
the full keyboard 381 in Fig. 25 is displayed for the
10 entry of a server, a login name and a password so that
data can be received from the server.

[HD Setting sub-screen]

Upon the depression of the HD check button 646
that is used in common for the WWW, E-Mail, FAX and FTP
15 categories, the hard disk setting screen 541 in Fig. 39
is displayed.

As is described above, this hard disk setting
screen 541 can be used to designate the setup to be
used for transmitting data to the hard disk.

20 [Print Setting sub-screen]

Upon the depression of the print out check button
647 that is used in common for the WWW, E-Mail, FAX and
FTP categories, the print setting screen 711 in Fig. 52
is displayed.

25 The print setting screen 711 has the same
functions as has the print setting screen 551 in Fig.
40, and with it a setup can be designated for the

Fig. 53 is a diagram showing the TASKS main screen 721 that is displayed upon the depression of the main tab "TASKS" 305.

When a start button 732 is depressed while the
10 TASKS main screen 721 is displayed, an operation for
automatically processing externally received document
data and for periodically printing (retrieving) the
data is performed in accordance with the parameters
that are designated on the screen 721.

At the time of initialization, including
20 resetting, the WWW sub-screen 741 is displayed.

Thus, a task to which the select check mark has been added is executed. A task for which no select

check mark has been provided is stored in the apparatus 100 and is not executed.

Upon the depression of a new button (New) 729, the WWW detailed setting screen 751 in Fig. 54 is

5 displayed, which will be described in detail later. A new task can be entered on the WWW detailed setting screen 751.

When one task in the WWW task list 727 is selected and an edit button (Edit) 730 is depressed, the WWW
10 detailed setting screen 751 in Fig. 54, in which information for the selected task is included, is displayed. The settings on the WWW detailed setting screen 751 of the information for the selected task can be edited.

15 When a task in the WWW task list 727 is selected and a delete button (Delete) 731 is depressed, that task is deleted.

[WWW detailed setting screen]

The WWW detailed setting screen 751 includes, as
20 is shown in Fig. 54, the RETRIEVE main screen 641 in Fig. 47 and components 752 to 764, a check time display box 765, a check time setting button 766, a print change check button (Print When Changed) 767, a transmission check button 768, an OK button 770 and a
25 cancel button 769, all of which are employed in common with the WWW sub-screen 661.

The check time display box 765 is blank when the

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WWW detailed setting screen 751 is displayed following the depression of the new button 729. When the screen 751 is displayed following the depression of the edit button 730, a designated task execution time is

5 displayed. Further, immediately after the setting is performed on the check time sub-screen, which will be described later, the designated task execution time is displayed.

10 Upon the depression of the check time setting button 766, the check time sub-screen that will be described later is displayed. On this screen, the time for executing a task can be set.

[Check time sub-screen]

15 When the check time setting button 766 is depressed on the WWW detailed setting screen 751 in Fig. 54, the check time sub-screen 771 in Fig. 55 is displayed.

20 The check time sub-screen 771 includes schedule mode setting buttons 772 to 774, a time input box 775, an OK button 779 and a cancel button 778.

25 In Fig. 55 is shown the screen display when the "Once" button 772, of the three schedule mode setting buttons 772 to 774, is selected and depressed. In this case, a "month" input box 776 and a "date" input box 777 are displayed. Upon the selection of these input boxes 776 and 777, the number-key pad 501 in Fig. 35 is displayed for the entry of the date on which the task

is to be executed.

Upon the depression of the "Weekly" button 773, day setting buttons 781 are displayed, as is shown in Fig. 56. With the day setting buttons 781, the day of the week a task is to be executed can be entered. It should be noted that in a week a plurality of days can be designated.

Upon the depression of the "Monthly" button 774, a "month" input box 791 is displayed, as is shown in Fig. 57. When the input box 791 is selected, the number-key pad 501 in Fig. 35 is displayed for the entry of the month a task is to be executed.

[MGMT screen]

Fig. 58 is a diagram showing the management main screen 801 that is displayed upon the depression of the main tab "MGMT" 306.

[CONFIG screen]

Fig. 59 is a diagram showing the configuration main screen 811 that is displayed upon the depression of the main tab "CONFIG" 307.

[Full keyboard]

As is described above, the full keyboard 381 in Fig. 25 is displayed when a character input box on a screen is selected.

Characters can be entered by depressing the keys on the keyboard 381. The full keyboard 381 is especially arranged so that the characters "www" can be

entered by depressing the "www" key, and so that the characters "com" can be entered by depressing the "com" key.

[Number-key pad]

5 As is described above, the number-key pad 501 in Fig. 35 is displayed when a numerical value input box or the month and date input boxes on a screen are selected.

[Error screen]

10 When an error occurs during the manipulation of devices on the above screens, the error screen 821 in Fig. 60 is displayed.

15 The error screen 8721 includes a message display box 822 in which an error message is displayed using text, and an OK button 823 for closing the error screen 821.

20 This completes the explanation given for the screen structures of the LCD display device 171 of the operation unit 132 of the image processing apparatus 100, the manipulation of devices on the screens, and associated processes.

25 An explanation will now be given for a device information service (hereinafter referred to as "DIS") employed by the image processing apparatus 100, and associated scan processing and printing processing.

[DIS]

 In the image processing apparatus 100, the control

unit 110 defines, as "DIS", the database (see Figs. 1 and 12) and an interface (I/F) for the database. In the database, a setup value for a job (the scanning or the printing operation), the function and the status of a device (the scanner 133, the printer 134, etc.) and accounting information are stored as a data form that conforms to the control API 268.

Fig. 61 is a diagram showing the exchange of data by a job manager 269 and a DIS 831, by the job manager 269 and a scanner manager 274 or a printer manager 276, and by the DIS 831 and the scanner manager 274 or the printer manager 276.

Essentially, dynamic information, such as an instruction for starting the scanning operation or the printing operation (job) is directly transmitted by the job manager 268 to the scanner manager 274 or the printer manager 276 (document manager). Static information, such as the function of the scanner 133 or the printer 134 and the contents of the scanning or the printing operation (job), is obtained from the DIS 831.

The static information or the dynamic information output by the scanner manager 274 or the printer manager 276, and event information are transmitted via the DIS 831 to the job manager 269.

When the scanner manager 274 or the printer manager 276 sets data in, or obtains data from the database of the DIS 831, since the data form in the DIS

831 conforms to the control API 268, mutual conversion is performed between the data form conforming to the control API 268 and the data form that the scanner manager 274 and the printer manager 276 can understand.

5 For example, to store status data in the database of the DIS 831, the scanner manager 274 and the printer manager 276 interpret the device inherent data, convert them into the data form defined by the control API 268, and write the resultant data in the database of the DIS
10 831.

 It should be noted that when the job manager 369 stores data in or obtains data from the database of the DIS 831 no data are exchanged by the two.

 The DIS 831 updates event data in accordance with
15 various event information received from the scanner manager 274 and the printer manager 276.

 Fig. 62 is a diagram showing various databases stored in the DIS 831.

 In Fig. 62, first, a supervisor DB 842 is used to
20 store the status and user information for the apparatus 100. Among the information stored in the supervisor DB 842, information, such as a user ID and a password, that requires a backup is stored in nonvolatile memory, such as an HDD or a backup memory.

25 A scan component DB 843 and a print component DB 844 are provided for corresponding components that are present (in this case, the scanner 133 and the printer

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134).

For an apparatus including only a printer, for example, only the print component DB 844 is provided, while for an apparatus including only a facsimile machine, only a FAX component DB is provided.

At the time of initialization, the scanner manager 274 and the printer manager 276 store the functions and statuses of the scanner 133 and the printer 134 in the scan component DB 843 and the print component DB 844, respectively.

Similarly, upon initialization, the scanner manager 274 and the printer manager 276 store the functions available with the scanner 133 and the printer 134, and the support statuses in a scan job service DB 845 and a print job service DB 846, as well as in the scan component DB 843 and the print component DB 844.

Each time a scanner job, a print job, and associated document information is generated, a scan job DB 847, a print job DB 846, a scan document DB 849 and a print document DB 850 are dynamically obtained and initialized by the scanner manager 274 and the printer manager 276, and the setting up of necessary items is performed.

Before the scanning process or the printing process is started, the scanner manager 274 or the printer manager 276 reads necessary data from the

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stores again the obtained image data in the RAM 112.

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At this time, if there is still a document sheet

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that is related to the printing processing.

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In Fig. 66, the printer 134 is a printer function

Upon receiving the job from the job manager 269, the printer manager 276 reads, from the DIS 831, the information required for the execution of the job. At this time, the printer manager 276 sets the obtained information in the printer 134 via the device I/F (engine I/F) 122 and the internal DPRAM.

Specifically, assume that a current job is the printing of one copy of two pages of non-compressed binary images on letter size (11" x 8.5") sheets, and that the printer 134 has a resolution of 600 dpi. First, when the job is received, the printer manager 276 obtains the number of bytes WIDTH (hereinafter referred to as an image width) for the width of an image (the width on the 8.5" side) by calculating:

Then, the printer manager 276 obtains the number of lines LINES by calculating

The printer manager 276 sets, in the device I/F 122 (the engine I/F), the image width WIDTH, the line

engine I/F).

The printer 134 prints the received image data on a prepared paper sheet. When the printer 134 detects the rear edge of the paper sheet, it sets to on a command indicating the end of the printing for the first page at the address IMAGE_END in the DPRAM, and sends a notification to that effect to the printer manager 276.

Upon receiving from the printer 134 the print end notification for the first page via the DPRAM, the printer manager 276 calculates the image width WIDTH and the line count LINES for the second page. Then, the printer manager 276 sets, in the device I/F 122 (the engine I/F), the image WIDTH, the line count LINES and the address SOURCE on the image bus 120 (PCI bus) at which the image data for the second page are stored.

As is shown in Fig. 69, the VCLK is constantly output by the printer 134.

5 The HSYNC is output in synchronization with the start of the printing of one line by the printer 134. That is, the HSYNC is output to the printer 134 by the printer manager 276 when the start of the output of image data is instructed.

10 The device I/F 122 (the engine I/F), which
receives the VCLK and HSYNC, employs the internal video
controller to read, from the image bus 120 (PCI bus),
image data having the image width WIDTH set by the
printer manager 276, in accordance with the address
15 SOURCE that is also set by the printer manager 276.
The device I/F 122 outputs the obtained image data as a
video signal (Video Data) to the engine I/F cable 891.

The device I/F 122 (engine I/F) repeats the above process the number of times that is equivalent to the line count LINES, which is also set by the printer manager 276.

Thereafter, an interrupt is issued by the printer
134 for the printing end (IMAGE_END) for the first
page.

25 This completes the explanation given for the DIS
used for the image processing apparatus 100, and the
associated scanning and printing processing.

In order to simplify the explanation, the image processing apparatus 100 is defined as a local device on the transmission side, and apparatuses connected to the image processing apparatus 100 via a network, e.g., the printer 238 in Fig. 11 and the image processing apparatus 100', which has the printer function, are defined as remote devices on the reception side. An explanation will be given for an example where image data scanned by the local device are printed by the remote device.

The same reference numerals as are in Fig. 1 are also used in Fig. 70 to denote corresponding components, and no detailed explanation for them will be given.

As is shown in Fig. 71, the user registration table 902 includes an ID number field 921 for storing user ID numbers (user IDs); a password field 922 for storing passwords; a user name field 923 for storing user names using character string data; and an

A user ID is a combination of identification data for the division of an organization to which a user belongs and personal identification data. With the user ID, data totalization can be performed for each person or for each division.

Only data for a user who is permitted to use a device are registered in the user registration table 902 by the manager of the pertinent device.

When, for example, a user desires to employ the local device or the remote device, the user submits his or her name and password to the manager of the pertinent device, and requests that the data be registered in a vacant data entry location in the user registration table 902. The manager registers the user data in a vacant data entry location in the table 902. If there is no vacancy in the user registration table 902, user data that is not required are deleted from the currently registered data in the user registration

A counter table 905 is provided for the local device. For each user registered in the user registration table 902, the counter table 905 includes a scanning counter for counting the number of scanning processes performed by the scanner 133, a printing counter for counting the number of printing processes performed by the remote device, and user device use information.

First, the user of the local device confirms that the ID input screen 311 in Fig. 15 is displayed on the LCD display device 171 (see Fig. 3) of the operation unit 132, and that the log-on operation is enabled. Then, on the ID input screen 311, the user enters his or her ID and password (steps S931 and S932).

The CPU 111 then employs an authentication unit 901 to obtain the input user ID from the ID number field 921 in the user registration table 902, and

Following this, the CPU 111 determines whether an ID that matches the user ID that was input is present in the ID number field 921 (step S934).

5 If a match for the user ID is not obtained, the
CPU 111 ascertains that the user does not have
permission to use the pertinent device, and displays
the error screen 821 in Fig. 60 on the LCD display
device 171 of the operation unit 132 to notify the user
10 no match was found (step S938).

Thereafter, the CPU 111 terminates the processing, and again enables the log-on operation by displaying the ID input screen 311 on the LCD display device 171 of the operation unit 132.

15 If at step 934 a match for the user ID is found,
the CPU 111 employs the authentication unit 901 to
compare the password that was input with a password in
the password field 922 in the user entry that is
specified at step S933 (step S935).

20 The CPU 111 then determines whether the passwords
match (step S936).

If the passwords do not match, the CPU 111 ascertains that the user has not obtained to use the pertinent device, and to notify the user that no match was found, displays the error screen 821 in Fig. 60 on the LCD display device 171 of the operation unit 132 (step S939).

If at step S936 a password match is found, the CPU 111 shifts the ID input screen 311 on the LCD display device 171 of the operation unit 132 to the operation screen 301 with which the device can accept normal entry from the user.

Thereafter, on the operation unit 132, the user performs the following operation.

The user depresses the main tab "SEND" 303 at the top of the operation screen 301 to transmit image data via the network to the remote device. Then, the SEND main screen 351 in Fig. 23 appears on the LCD display device 171 of the operation unit 132.

If the address of the object device (the remote

device) is not included in the address display portion 352 of the SEND main screen 351, the user depresses the address book button 358. Then, the address book screen 391 in Fig. 26 appears on the LCD display device 171 of the operation unit 132.

The user searches for or adds a destination to the address book screen 391. At this time, the destination can be deleted on the address book screen 391, or the detailed information screen 401 in Fig. 27 can be displayed.

The user depresses the scanner check button 365 on the SEND main screen 351 to set the condition for the scanning operation. Then, the scan setting screen 591 in Fig. 43 appears on the LCD display device 171 of the operation unit 132.

Icons corresponding to various images, such as a photographic image (Photo), a character (Text), a photograph and character mixture (Photo Text), a newspaper (Draft) and a default value (Not Defined), are displayed in the preset mode select display box 592 on the scan setting screen 591.

The user selects one optimal icon for a document to be scanned. As a result, the resolution and the optimal scan mode for the document (a binary reading mode or a multi-valued reading mode) are automatically designated.

To change the resolution and the scan mode that

are automatically set, the user depresses the resolution select button 599 on the scan setting screen 591. Then, the resolution list 611 in Fig. 44 is displayed on the LCD display device 171 of the operation unit 132. Thereafter, the user selects a desired resolution from the list 611.

Furthermore, when the user depresses the mode select button 601 on the scan setting screen 591, the scan mode list 621 in Fig. 45 is displayed on the LCD display device 171 of the operation unit 132. Thereafter, the user selects a desired mode from the list 621.

As is described above, the user can designate the resolution and the scan mode separately.

15 Furthermore, to set the paper size for a document
to be scanned, the user depresses the paper size select
button 597 on the scan setting screen 591. Since the
paper size list 631 in Fig. 46 is displayed on the LCD
171 of the operation unit 132, the user can select an
20 appropriate paper size for the document.

In addition, to adjust the density, the user manipulates two buttons adjacent to the display box 602 on the scan setting screen 591, and sets a desired density.

25 Fig. 73 is a flowchart showing the processing performed after the user has set the information for a transmission destination device (a remote device) and

First, the user places a document on the document table or the automatic document feeder of the scanner 133 (step S941).

When the CPU 111 detects the manipulations at steps S941 and S942, the CPU 111 permits the scan operation control 904 to instruct the scanner 133 to begin to scan the document (step S943).

Thus, the scanner 133 starts the scanning, and stores the obtained image data in the RAM 112 each time the scanning of one page of the document is completed (step S944).

At the same time, the CPU 111 permits the scan operation control unit 904 to search the counter table 905 and to obtain the scan counter corresponding to the user ID of the user who is employing the local device, and to update the value of the scan counter and the device use information related to the scan counter.

The CPU 111 permits the communication process unit 903 to issue a print request to the remote device (step S945).

The print request includes user information (information for a user who is employing the local

The print counter is provided for each of the various paper sizes, and the value of the print counter that corresponds to the paper size used by the remote device is updated.

If the print end notification for all the pages has been received, the printing processing is terminated. If not, program control returns to step S949 and the above described processing is repeated.

First, the user places a document on the document table or in the automatic document feeder of the scanner 133 (step S961).

When the CPU 111 detects the manipulations at steps S961 and S962, the CPU 111 permits the scan

Thus, the scanner 133 starts scanning and stores the obtained image data in the RAM 112 each time the scanning of one page of the document is completed (step S964).

The CPU 111 permits the communication process unit 903 to issue a storage request to the remote device (step S965).

The user information included in the storage request can also be read from the user registration table 902 and can be automatically added to the storage request. When more correct user authentication is to

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Fig. 75 is a flowchart showing the processing performed after the user has set the information for an transmission destination device (remote device) and information for the document to be scanned. In this example, the facsimile transmission function of the remote device is employed to transmit the obtained document data via the PSTN or the ISDN to an object facsimile machine.

The user then depresses the start 366 on the SEND main screen 351 (step S972).

10 Thus, the scanner 133 starts scanning, and stores
obtained image data in the RAM 112 each time one page
of the document is scanned (step S974).

20 The CPU 111 permits the communication process unit
903 to issue a facsimile transmission request to the
remote device (step S975).

The user information included in the facsimile

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If the user who issued the facsimile transmission

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device performs the following process.

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processing is repeated.

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As is described above, according to the embodiment, in the network including a local device and remote devices, the local device performs the user authentication process by using the user ID and the password input by a user. In addition, the local device transmits an operation request to a desired remote device together with the input user ID and password.

With this arrangement, only the authorized user is permitted to use the local device and the remote devices on the network.

The present invention is not limited to the above embodiment. That is, the present invention can be applied not only to a scanner that is a local device and a printer that is a remote device, but also to copiers that serve as the local device and the remote device, or a scanner and a copier, or a monochrome copier having a color scanner and a color printer.

The objective of the present invention can also be implemented in the following manner: a storage medium in which software program code to implement functions of the host and the terminal in the above embodiment is loaded to a computer (a CPU or an MPU) in an apparatus or in a system, and the program code is read by the computer in the system or the apparatus.

In this case, the software program code accomplishes the functions of the above described embodiment. And the program code and means for supplying the program code to the computer, e.g., a storage medium on which such program code is recorded, constitute the present invention.

A storage medium for supplying such program code can be, for example, a ROM, a floppy disk, a hard disk, an optical disk, a magneto-optical disk, a CD-ROM, a CD-R, a magnetic tape, or a nonvolatile memory card.

In addition, the present invention also includes not only a case where the functions in the previous embodiment can be performed when program code is read and executed by the computer, but also a case where, according to an instruction in the program code, an OS (Operating System) running on the computer, or another application software program, interacts with the program code to accomplish the functions in the above embodiment.

Furthermore, the present invention includes a case

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Furthermore, in the embodiment, the local device performs the user authentication process by using the user information (the user ID and the password), which is received together with an operation request from the remote device, and registered information.

As a result, only when the user who issued the operation request is an authorized user, the local device can accept the operation request and perform the associated operation.

Specifically, assume that image data are obtained by the local device (the first device) having the scanner function, and are printed by the remote device (the second device) that has the printing function and that is connected via the network. First, when the user inputs the user ID and the password to the local device, the local device performs the user authentication by using the user ID, the password and information that is prepared in advance. When it is ascertained that the user is a authorized user, the local device begins the scanning process in accordance with an instruction entered by the user. At the same time, the local device transmits, across the network to the remote device, the input user ID and password together with the operation request that is issued to the remote device by the user.

The remote device performs the user authentication process by using the user ID and password received from

the local device, and information that is prepared in advance. When the user at the local device who issued the operation request to the remote device is an authorized user, the remote device accepts the
5 operation request from the local device, and prints data in accordance with the request.

With this arrangement, the remote device does not unconditionally accept the operation request from the local device and perform the requested operation, and
10 can perform the operation only upon the receipt of a request from an authorized user. Further, as is described above, when the local device ascertains that the user is an authorized user and when the user issues an operation request to the remote device, the local
15 device (which already has information required for user authentication) requests the authentication by the remote device. As a result, the input of authentication information by the user and an instruction to perform the authentication process are
20 not required.

In the above described communication between the local device and the remote device, the status of the device (the results of the user authentication process) may be transmitted. In addition, if the local device
25 requests that the user input detailed user information other than the user ID and the password, a more accurate user authentication process can be performed.

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